

# Preprint: Overdose prevention centres as spaces of safety, trust and inclusion: a causal pathway based on a realist review

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## Abstract

**Background:** Overdose prevention centres (OPCs) are non-residential spaces where people can use illicit drugs (that they have obtained elsewhere) in the presence of staff who can intervene in order to prevent and reverse any overdoses that occur. Many reviews of OPCs exist, but few explain how OPCs work.

**Methods:** We carried out a realist review, using the RAMESES reporting standards. We systematically searched for and then thematically analysed 391 documents that provide information on the contexts, mechanisms, and outcomes of OPCs.

**Findings:** Our retroductive analysis identified a causal pathway that highlights the feeling of safety – and the immediate outcome of not dying - as conditions of possibility for the people who use OPCs to build trust and experience social inclusion. The combination of safety, trust, and social inclusion that is triggered by OPCs can – depending on the contexts in which they operate - generate other positive outcomes, which may include less risky drug use practices, reductions in blood borne viruses and injection-related infections and wounds, and access to housing.

**Interpretation:** OPCs can enable people who live with structural violence and vulnerability to develop feelings of safety and trust that help them stay alive and to build longer term trajectories of social inclusion, with potential to improve other aspects of their health and living conditions.

## Introduction

There are ongoing public health crises of drug-related deaths in the USA, Canada and the UK.<sup>1,2</sup> Worldwide, the illicit drugs that are most commonly involved in these deaths are heroin, prescribed opioids, and cocaine.<sup>3</sup> These deaths are heavily concentrated among groups who suffer from material deprivation, psychological trauma, substance use disorders, co-occurring health problems, physical violence, homelessness, and other aspects of extreme social exclusion.<sup>4-8</sup> There is an urgent need to develop responses to bring vulnerable people into services that keep them from dying.<sup>2</sup>

As a response to the successive pandemics of viral hepatitis, HIV, and then the crises of drug poisoning deaths, we have seen the development of overdose prevention centres (OPCs). These were first operated in Switzerland and Germany in the mid-1980s,<sup>9</sup> then spreading to other

countries in continental Europe,<sup>10</sup> and then to Australia, Canada, Mexico, Colombia, Iceland, the UK and the USA.<sup>11</sup> These are non-residential spaces where people use illicit drugs (that they have obtained elsewhere) in the presence of staff who can intervene in order to prevent and reverse any overdoses that occur. OPCs are also known as drug consumption rooms and various other names. Different terms are used in different places for different types of OPC. For example, in Canada ‘overdose prevention site’ is used for less formally organised, clinical spaces than a ‘supervised consumption service’, or ‘supervised injecting facility’.<sup>12</sup> Here, we use OPC as a general term that covers all such services.

There are already several systematic reviews that cover the outcomes of OPCs.<sup>17–23</sup> They generally find that OPCs have a positive impact in reducing and reversing overdoses and injecting risk behaviours, increasing uptake of drug treatment services, and no impact on crime, but the evidence and the measures used for these outcomes are mixed.<sup>9,24</sup> There have also been three reviews of the findings of qualitative research on OPCs.<sup>25–27</sup> The provision of OPCs has recently been recommended by both the European Monitoring Centre for Drugs and Drug Addiction and the European Centre for Disease Prevention and Control ‘in order to reduce injecting risk behaviour among people who inject drugs’.<sup>28</sup>

Here, we report on the first realist review of OPCs. The aim of a realist review is to reveal the underlying mechanisms and complex causation of the effects of an intervention.<sup>29</sup> It does this by synthesising evidence from multiple sources to theories the causal pathways in which the components of an intervention combine with its contexts and mechanisms to produce its effect.<sup>30,31</sup> A realist review, in contrast to most systematic reviews, aims to understand how an intervention works, not just if it works, often including a wider range of research methods and studies. The critical realist assumption is that practically adequate knowledge is to be gained by inferring the underlying generative mechanisms of a complex intervention, not just by looking for constant conjunctions of independent and dependent variables in experimental and quasi-experimental research.<sup>32–34</sup> This article reports on our realist review to answer the question: how can we explain the outcomes that have been observed in studies of OPCs?

## Methods of the realist review

We registered the protocol for this review in the PROSPERO international register of systematic reviews (CRD42023414273).<sup>35</sup> We report the implementation of this protocol in accordance with the RAMESES reporting standards for realist reviews.<sup>36</sup> We first built a provisional programme theory on existing reviews and through consultation with stakeholders in the field. These included members of the project advisory board, members of the Drug Science Enhanced Harm Reduction Working Group, and representatives of people who use drugs, including members of the European Network of People Who Use Drugs.

From these reviews and consultations, we also created a list of search terms, as shown in Table 1. We used these search terms in the bibliographic databases PubMed, Scopus, and the Web of Science. We also searched in the database of grey literature of the International Society for the Study of Drug Policy and the references used in a recent narrative review.<sup>37</sup> Our search was limited to documents published in English, although many of these included insights from studies published in other languages, or were themselves translated from other languages.

We screened titles and abstracts, using the software application Rayyan. Ten percent of the identified documents were screened by two researchers (JK and AS), to agree the process for inclusion and exclusion. We then downloaded full versions of the documents we considered to be relevant into a Zotero library which we then uploaded into NVivo for analysis. We excluded documents that did not meet inclusion criteria, and included cited documents that were referred to in the selected documents where they met criteria. We included studies that provided data about the operation of actual OPCs (not just proposed services), whatever method these studies used. We did not set any time limits for the date of publication of documents to be included. The earliest we included in the review was published in 1999.

**Table 1. Details of literature search**

Dates of search	18-20 April 2023
Databases and hits	SCOPUS – 1,008 Pubmed – 664 Web of Science – 986 ISSDP – 10
Search terms	“overdose prevention cent*” OR “overdose prevention site*” OR “overdose prevention program*” OR “overdose prevention facilit*” OR “supervised inject* service*” OR “supervised inject* facilit*” OR “supervised inject* centre*” OR “supervised inject*” OR “supervised inject* program*” OR “supervised inject* room*” OR “supervised fixing room*” OR “supervised drug consumption facilit*” OR “supervised injectable maintenance clinic*” OR “safe* inject* facilit*” OR “safe* inject* space*” OR “safe* consumption space*” OR “drug consumption room*” OR “drug consumption facilit*” OR “medically supervised inject* cent*” OR “fix* room*” OR “safe* environment intervention*” OR “shooting galler*”
Inclusion criteria	1. Providing empirical data on actually existing OPCs 2. Written in English
Exclusion criteria	1. Written in another language than English 2. Feasibility studies 3. Opinion pieces 4. Commentaries 5. Policy reports

In line with the realist approach, we did not make general assessments of document or study quality. Rather, we made judgements on the relevance and rigour of particular items of reported data; on whether they were apt for building a theory of OPCs, and on the credibility and trustworthiness of the method used to generate the data.<sup>36</sup>

We extracted data from the included documents by highlighting relevant segments of text in Nvivo.<sup>38</sup> We did this according to a provisional coding structure based on our initial programme theory, listing the contexts, mechanisms, and outcomes of OPCs that we expected to find. We follow Greenhalgh and Manzano in thinking of contexts as layered, relational and dynamic features of the environments within which OPCs operate that affect how it works.<sup>39</sup> Some contexts pre-exist the operation of the OPC, while others emerge from the interaction between the interventions provided by the OPC and

its environment. We call the former 'pre-existing contexts' and the latter 'dynamic contexts'. We understand mechanisms as the underlying causal processes which are triggered by the various components of OPCs in their contexts and which generate the outcomes of OPCs.<sup>40</sup>

We built an initial coding structure of contexts, mechanisms and outcomes from our provisional programme theory. To this provisional list, we added codes as we found other relevant concepts in the documents we reviewed. We then reorganised these provisional and emergent codes into core and satellite concepts. In this way, our process was compatible with both adaptive and abductive analysis.<sup>41,42</sup> In carrying out this analysis, we drew on Tim Rhodes' concept of the 'risk environment', the first two levels (physiological and safety needs) of Abraham Maslow's well-known hierarchy of needs, and the COM-B model from Michie, Atkins and West's explanation of how capacities, opportunities and motivation combine to produce behavioural change, as well as the ontological assumptions of critical realism.<sup>33,43-45</sup>

The final stage of our analysis was retroduction. This is an interpretive form of inference that moves from observations of actual events to theorise underlying generative structures.<sup>40,42</sup> This inference must go beyond the empirical evidence on observed events to suggest provisional conclusions on underlying, contingent combinations of context, mechanism and outcome. It asks: what makes the outcome of an intervention possible? In this way, retroduction identifies the theorised causal pathways by which interventions lead to outcomes. To summarise such pathways, we state if [the necessary combination is present] then [the outcome will usually occur] because [a generative mechanism or mechanisms is/are triggered].<sup>46,47</sup>

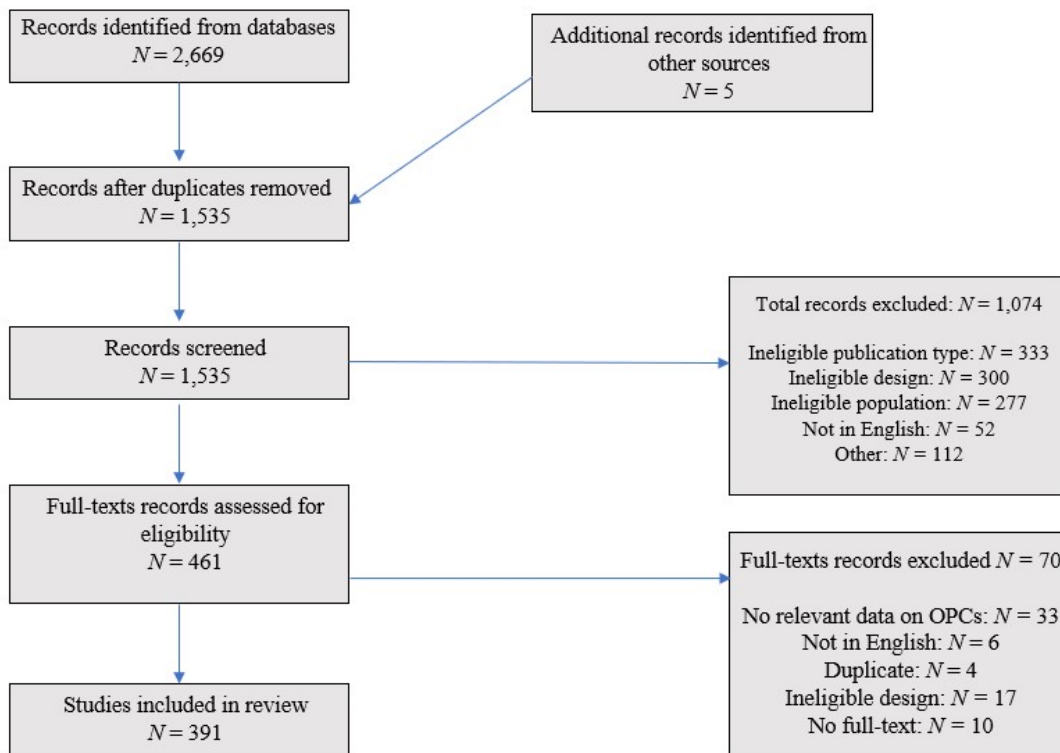
The research involved no primary data collection and so required no ethical approval.

## Results

We present the results of the literature search and document selection in the PRISMA diagram<sup>48</sup> in Figure 1, including reasons for exclusion of 1,139 documents from our final dataset of 1,535 articles and reports. Documents coded as 'ineligible publication type' included commentary and discussion pieces. Documents coded as 'ineligible design' included feasibility studies of OPCs that did not actually operate. Documents coded as 'ineligible population' included studies that did not report data on OPCs, but only on other services. Documents coded as 'other' included, for example, conference abstracts which did not provide empirical data.

Included documents reported on OPCs using a variety of research methods, as displayed in Table 2. Of the 64 reviews, 38 were narrative reviews, 20 were systematic reviews, five were scoping reviews, and one was a realist review of naloxone-based interventions.<sup>49</sup>

**Figure 1. PRISMA diagram of document selection**



**Table 2. Research methods used in selected documents**

Qualitative interview study	83
Cohort study	73
Review	64
Ethnography	33
Case study	23
Modelling study	19
Monitoring study	19
Quasi-experimental evaluation	14
Document analysis	13
Policy analysis	9
Other evaluation	8
Health surveillance	7
Pilot study	4
Chemical analysis	3
Choice experiment	3
Participatory photography	3
Legal analysis	2
Ethical analysis	1
Randomised trials	0

The selected documents included information on 89 OPCs in 18 countries, as listed in Table 3. This did not include all actually operating OPCs. In 2018, the European Monitoring Centre on Drugs and Drug Addiction reported that ‘there are: 31 facilities in 25 cities in the Netherlands; 24 in 15 cities in Germany; five in four cities in Denmark, 13 in seven cities in Spain; two in two cities in Norway; two in two cities in France; one in Luxembourg; and 12 in eight cities in Switzerland’.<sup>14</sup>

Not all of the OPCs covered by the selected documents are still operating. For example, the three reported in Australia include the ‘tolerance room’ that preceded the opening of the Sydney Medically Supervised Injecting Centre (MSIC).<sup>50</sup> The one in the United Kingdom was an unsanctioned service that operated in Glasgow in 2020/21.<sup>51</sup>

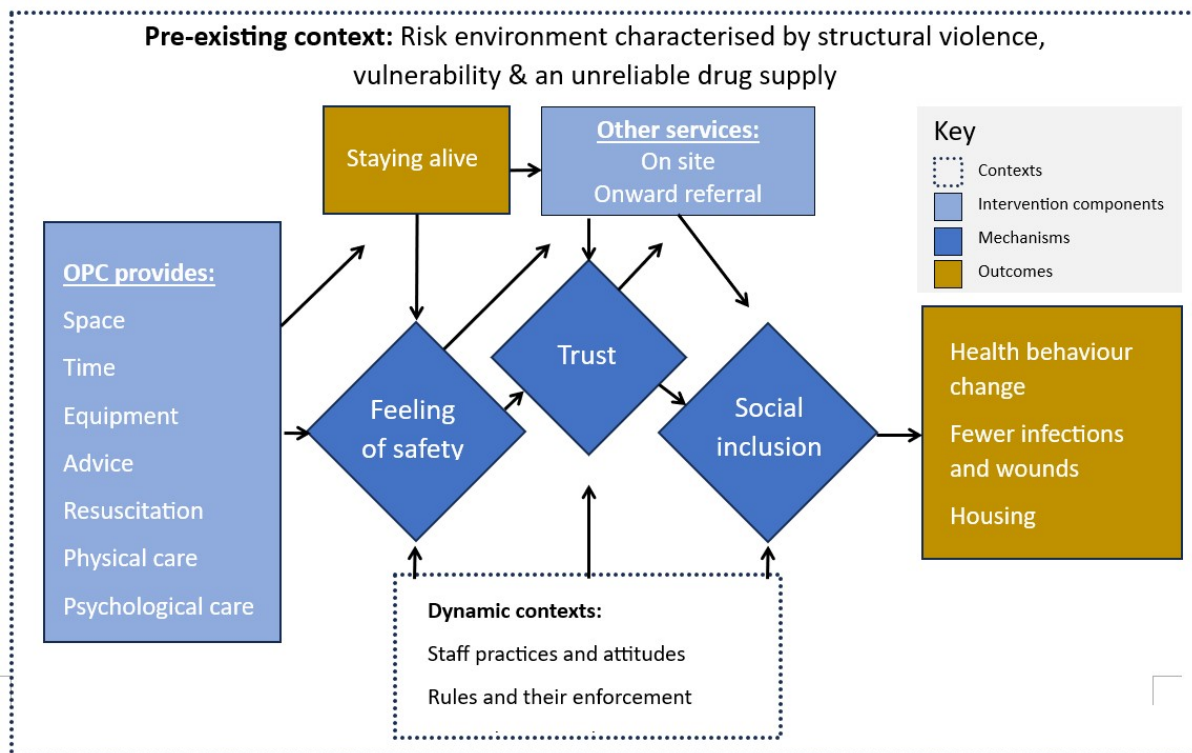
**Table 3. Number of OPCs covered by selected documents by country**

Canada	30
Germany	30
Netherlands	6
Australia	3
Denmark	3
Spain	3
United States	3
France	2
Belgium	1
Greece	1
Italy	1
Luxembourg	1
Mexico	1
Norway	1
Portugal	1
Switzerland	1
United Kingdom	1

Supplementary material includes a list of the selected documents, and a list of the OPCs they cover in each country.

To illustrate the main causal pathway identified in our retroductive analysis, we present it as a diagram in Figure 2. This diagram shows the schematic connections between intervention components that are provided in specific contexts which trigger particular mechanisms and outcomes. The effects of the three key, underlying mechanisms are influenced by the dynamic contexts that emerge in the interaction between intervention components and pre-existing contexts. In critical realist analysis, mechanisms are inferred from the observable traces produced by actual events which are captured in empirical research, even though these underlying mechanisms cannot be directly observed and so are difficult to measure.<sup>52</sup>

**Figure 2: Causal pathway diagram for OPCs**



The experience of structural violence and vulnerability described by Rhodes et al<sup>43</sup> was evident in many of the studies we reviewed. People who use OPCs are typically exposed to very high levels of homelessness, violent victimisation, trauma, and material deprivation.<sup>53–56</sup> These issues may be particularly acute for women and members of racially marginalised groups, including indigenous people.<sup>57,58</sup> They are more commonly reported for people who use OPCs than for other people who use the same drugs. For example, a study of young people who injected heroin in Spain found that those who used OPCs were even more vulnerable than those who did not, with higher levels of homelessness and illicit income.<sup>59</sup> In Vancouver, homelessness and public drug use were predictive not only of willingness to use but also of actual use of OPCs in a cohort of people who inject drugs.<sup>60</sup> In Ottawa, a survey of people who inject drugs or smoked crack cocaine found that – of those who were willing to use an OPC – 60 per cent were unstably housed, 50 per cent had had their movement restricted by law enforcement agencies, and 13 per cent were HIV positive.<sup>61</sup>

The socially structured aspects of this vulnerability are observed in the criminalisation and displacement of people who use drugs,<sup>62–64</sup> legal restrictions on the provision of harm reduction services,<sup>17,65,66</sup> and decisions to restrict access to basic services. See, for example, the link between the reduction in provision of supported housing for people with mental health problems in Vancouver and the increased number of people involved in street-based injecting in the city in the 2000s.<sup>67</sup> More recently, the number of people who inject drugs in North America has substantially increased,<sup>68,69</sup> and their environment has been made dramatically riskier by the entry of highly potent synthetic opioids into the illicit market.<sup>70</sup>

For people who have become dependent on a substance, using it can be felt as a basic physiological need.<sup>71</sup> OPCs do not meet this need by supplying substances to consume, but can solve the problem of space to use drugs, when they are open. In their absence, studies in multiple countries have

reported high levels of drug use in public in some urban areas, with associated problems of discarded paraphernalia and riskier injecting practices, including rushed injecting with non-sterile water and equipment.<sup>72–78</sup> Using in public exposes people to the public gaze and risk of police detection. Both are experienced as stigmatising and harmful.<sup>54,62</sup> Some people have reported using in public because it is safer for them.<sup>75</sup> They may fear dying if they overdose alone in a private setting, with nobody there to revive them. The reality of these fears is confirmed by a previous review which found that public injecting is associated with the risk of overdose, and linked to the need to consume hastily to avoid being seen, interrupted, or arrested.<sup>79</sup>

In contrast, OPCs can provide not only a space in which to use drugs, but also time to do so more safely and comfortably, sterile injecting equipment and advice on how to use it, resuscitation if overdose does occur, and various other forms of psychological and physical care. These may include a friendly welcome, a place to be warm and dry, food, drink and cleaning facilities, as well as more clinical support.<sup>80–82</sup>

While OPCs do not meet the physiological need for drugs, they can provide the second level of Maslow's hierarchy of needs, which is safety. The operation of OPCs as places of safety is a recurrent theme in qualitative research from multiple countries and locations.<sup>21,25–27,53,54,57,81,83–96,96–109</sup> This includes safety from overdose, but also from infection transmission, police detection and arrest, public stigmatisation, and violent victimisation. This latter aspect of safety is particularly salient for women involved in street-based drug use, who face high levels of gender-based violence.<sup>57,88,90,91</sup> Physical violence operates alongside the criminalisation of people who use drugs to shape the environment outside OPCs. These services are experienced as spaces of refuge from this risk environment. This feeling of safety was summed up in a quote from a man who used an OPC in Frankfurt:

Out on the streets you're always under pressure and have this fear that the police are going to catch you. Or you're in the toilet and someone knocks and yeah, you're in a rush. You can't enjoy your kick. That's the problem. And here you have your peace. You, you're safe.<sup>110</sup>

Houborg and Jauffret-Roustide make the important point that the conceptions of safety reported by people who use OPCs go beyond the narrower 'hygienic' meaning that is often used in discussions of public health.<sup>95</sup> It is not just about safety from overdose mortality or blood-borne viruses, but also about refuge, respite, and peace from various experiences of structural violence.

The need to feel safe was, for example, reported as a key motivation for people to use an unsanctioned OPC in Toronto. One of its users is quoted as describing this services as 'our safe sanctuary'.<sup>84</sup> Maslow's is not the only psychological framework to suggest that people's basic needs – including safety – must be fulfilled before they can address other common needs.<sup>111,112</sup> Here, we suggest that this feeling of safety is a condition of possibility for the generation of positive outcomes from OPCs. Without safety, people may avoid using these services, as was observed when a mobile overdose prevention site was perceived to be less safe than the larger supervised consumption site which it replaced in Lethbridge, Canada.<sup>94</sup>

The most immediate outcome experienced by people who use OPCs is that they do not die. People who use OPCs are frequently quoted as stating that the OPC 'saved my life'.<sup>97,102,105,109,113</sup> There is even an OPC in Hamburg which is called 'Stay Alive'.<sup>13</sup> Many thousands of overdoses are reported as having been reversed by OPCs providing first aid, oxygen, and naloxone when needed. This includes over 10,000 overdoses reversed in 21 years of operation at the Sydney MSIC.<sup>15</sup> In all the years and



places that have had OPCs in operation, we found reports of only three deaths; two in Germany, and one in the Netherlands.<sup>9,80,114</sup> Only one of these was reported as an overdose, and this happened in a toilet in the OPC, rather than in the room designated for drug use.

Two systematic reviews of quantitative studies suggest that OPCs do indeed reduce mortality among people who use them.<sup>18,19</sup> The most widely cited primary study of the effect of OPCs on mortality showed that deaths reduced more (by 35 per cent) in the immediate vicinity of the first officially sanctioned OPC in Canada than in neighbouring parts of Vancouver (where such deaths reduced by nine per cent in the same period).<sup>115</sup> Citations include a critique and rebuttal, also published in *The Lancet*.<sup>116,117</sup> Other Canadian studies also suggest reductions in death. For example, Kennedy et al.'s study of a cohort of people who inject drugs in Vancouver found lower rates of all-cause mortality among those who were frequent users of an OPC, even when controlling for potentially confounding variables, with an adjusted hazard ratio of dying of 0.46 for these frequent OPC users.<sup>118</sup> In the province of Alberta, increased access to OPCs between 2017 and 2019 was associated with a reduction in fentanyl-related deaths (from 178 in the fourth quarter of 2017 to 103 two years later), which then increased substantially (to 284 in the second quarter of 2020) when access to OPCs was limited.<sup>119</sup>

Several studies that did not directly examine effects on deaths have shown reductions in strong indicators of the risk of dying, such as non-fatal overdoses and ambulance call outs to overdoses.<sup>113,120,121</sup> However, some studies that have looked for effects on mortality did not find them.<sup>122,123</sup> Early evaluation of the Sydney MSIC found an effect in reducing ambulance call-outs, but not deaths.<sup>124</sup> A later study estimated that this OPC prevented between 55 and 110 deaths between 2007 and 2014.<sup>125</sup> Other modelling studies have also estimated reductions in deaths from OPCs.<sup>126,127</sup> None of the reviewed studies found that OPCs increase deaths.

The studies that do show effects in reducing deaths are not of the methodological design that would usually be used in clinical research to prove a causal effect.<sup>128</sup> Randomised controlled trials of OPCs are practically impossible, and may even be considered unethical, given the balance of observational evidence on their life-saving effects.<sup>129</sup> The reviewed research shows that OPCs are experienced as life-saving by the people who use them.

Our theorised causal pathway suggests that creating a feeling of safety and actually saving lives, combined with the various services that OPCs provide and refer to, trigger the mechanisms of trust and social inclusion.

Trust is an important mechanism that helps people work with each other towards shared goals.<sup>130</sup> Without trust for the OPC and its staff, people are unlikely to use it.<sup>64,131</sup> Building trust then helps people to make connections with other people and services.<sup>54,89,96,102,132,133</sup> Many of the people who use OPCs have low levels of trust in mainstream healthcare providers. For example, a study of an OPC in Barcelona reported the case of a man who had been diagnosed with Hepatitis C, but did not believe it until this was confirmed by someone he knew at the OPC. He said, 'I don't ask doctors; I ask people I trust'.<sup>134</sup> A Canadian study reported that 'many participants stated this was the first time they had formed a trusting, meaningful connection to a health or social service provider'.<sup>105</sup>

Social inclusion is 'the process of improving the ability, opportunity, and dignity of those disadvantaged on the basis of their identity, to take part in society'.<sup>135</sup> In this framing, social inclusion depends on people having access to resources, services, and spaces. OPCs can provide all three, but

only if people feel safe enough to use them. The documents we reviewed provided many examples of OPCs providing spaces for people to change their actions and opportunities through their inclusion in networks of support. Qualitative research on OPCs repeatedly show that they are places where people can find community, camaraderie and mutual assistance.<sup>57,94,98,105,106,136</sup>

Feeling safe and trusting the OPC provides a platform for making helpful connections. These can be to healthcare services that are directly related to drug use, including vaccination, and testing and treatment for blood-borne viruses.<sup>137–140</sup> Other primary health services can also be provided, including distribution of condoms and sexual health information, dentistry, and tobacco smoking cessation.<sup>15,141–144</sup> Access to drug detoxification and treatment is often facilitated by OPCs, whether on-site<sup>89,102,145</sup> or by onward referral.<sup>86,137</sup> This wide range of services can create significant benefits for individual and public health.

The staffing, and practices of OPCs act as dynamic contexts of these mechanisms of safety, trust and social inclusion. These influential contexts emerge in the interactions between the settings and staff of OPCs and the people who use them. The enforcement of tight rules and limited opening times can exclude potential users.<sup>15,57,64,81,146,147</sup> For example, banning assisted injecting (which is illegal in some jurisdictions) or injecting into the jugular vein (which is considered particularly unsafe) excludes people who cannot inject themselves, or have no other veins left to use.<sup>103,148,149</sup> On the other hand, access and trust can be boosted by the presence of people who have direct experience of drug use in the staff team.<sup>26,133</sup> The balance between accessibility and legality was observed, for example, at an unsanctioned OPC in Italy that was open 24 hours a day. Occasions of use of the OPC for illicit purposes (e.g. stripping copper from stolen electronic equipment) were reported, but the extended opening hours also enabled the OPC to provide naloxone to reverse overdoses that happened at night.<sup>150</sup>

Social inclusion can generate growing beliefs about capabilities for change, and so to positive outcomes.<sup>45</sup> In our review, we found reports of positive effects on numerous outcomes besides mortality, including reduced risk behaviours for the transmission of blood-borne viruses,<sup>18,87,124,151–154</sup> better care for cutaneous injection-related infections and wounds,<sup>84,155</sup> reduced use of emergency medical services,<sup>15,86,122,132,133,144,156–159</sup> and reductions in unsafe disposal of injecting equipment.<sup>124,150,152,154,160,161</sup> Some studies reported that people gained control over their drug use, with some people reducing or ending injecting drug use, or stopping illicit drug use altogether.<sup>162–165</sup> There are also several reports of people finding housing through OPCs, although this effect has not been systematically studied.<sup>13,27,81,94,98,109</sup> It is particularly difficult to isolate the effect of OPCs on infection transmission from the range of other services (including needle and syringe programmes) that aim at this outcome in the same places.<sup>80,166,167</sup>

These outcomes are not universally produced by every OPC. For example, a study from Catalonia found large reductions in public injecting among users of an OPC, and increases in safe syringe disposal and entry to drug treatment services, but it did not find a difference in non-fatal overdoses or drug use, reflecting other findings on continued drug use by users of other OPCs.<sup>80,83,168</sup> The expansion of harm reduction services in Barcelona, alongside the police closure of an open drug scene, was associated with a reduction in the number of syringes collected from public spaces, although there was a short term increase in the vicinity of one newly opened OPC.<sup>169</sup> In Lisbon, a study of community perceptions of the city's first mobile OPC found a reduction in the visibility of public injecting, although concern about street crime and discarded injecting equipment remained high.<sup>170</sup> In Ontario, the operation of two OPCs was associated with a reduction in emergency

department visits, but with an increase near a third.<sup>123</sup> In France, people who had access to either of the OPCs (in Paris and Strasbourg) were less likely to share injecting equipment than those (in Bordeaux and Marseille) who did not, but significant differences were not found for HCV testing or in use of opioid agonist therapy.<sup>171</sup>

Although one systematic review of OPC outcomes reported the reviewed evidence to be of ‘good methodological quality’,<sup>18</sup> another rated the certainty of evidence as low or very low.<sup>20</sup> In this review, we do not seek to provide a definitive test of whether OPCs generally ‘work’ in producing posited benefits. To do so would clash with our critical realist assumption that the effects of interventions do not follow universally applicable laws but rather depend on specific, contingent combinations of contexts and mechanisms.<sup>172</sup> For example, a time series analysis from the early years of the Sydney MSIC did not find a reduction in hepatitis C infections, but noted that this may have been because of the context of relatively low prevalence of hepatitis C in Australia at the time.<sup>124,153</sup>

## Conclusion

This article presents the main causal pathway that we identified from our thematic, abductive, and retroductive analysis of 391 selected documents, noting the underlying mechanisms of safety and trust which enable OPCs to trigger social inclusion, and so a wider range of outcomes than just saving lives.

Whereas most previous reviews of OPCs have focused on these services as discrete interventions that do or do not have effects, we found a more complex reality in which the outcomes of OPCs are contingent on specific combinations of contexts and mechanisms. The broader range of evidence included in our review enabled us to examine how OPCs operate in contexts characterised by violence, vulnerability and exclusion, and to collate evidence on the traces that the underlying causal mechanisms of OPCs produce in observable outcomes.

The causal pathway we present here from our realist review can be summarised as follows. If OPCs succeed in providing an experience of safety for people who are otherwise exposed to high levels of drug-related risk and other forms of harm and violence, then they can build the necessary trust to support trajectories towards social inclusion and improved health, because providing safety both reduces the risk of dying and becoming infected, but also creates a platform of trust from which people can build connections to people and services that can help them overcome the various adversities they face.

OPCs are not the only services that link people who use drugs to services that can improve their health and living conditions. This makes it difficult to disentangle the effects of OPCs from other harm reduction, treatment and social services. Nevertheless, our review suggests that in many of the places that OPCs have been established, their users find that the OPC plays a crucial role – which has not been fully played by these other services – in providing spaces of safety, trust and social inclusion.

## Research in context

### Evidence before this study

Existing reviews of overdose prevention centres suggest that they reduce morbidity and mortality among people involved in street-based drug use. These reviews mainly focus on OPCs as technologies of hygiene and on their role in preventing overdose deaths and viral infections among people who inject drugs.

### Added value of this study

We provide a theorised causal pathway, based on a realist review of the literature, which identifies the key combination of contexts through which OPCs trigger generative mechanisms that produce their outcomes. This can explain how OPCs can produce a wider range of outcomes than just preventing deaths and infections.

### Implications for policy and practice

Policy makers, practitioners and researchers can use this causal pathway in designing and evaluating OPCs in order to optimise, maximise and measure their processes and effects. They should consider how OPCs create feelings of safety and trust, and provide resources and services which support social inclusion. They should also aim for and measure a wider range of outcomes (including reductions in infection-related wounds, achievement of stable housing, and of control over drug use).

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